



Jan. - Feb. 2005

News

AEROSPACE EDUCATION

Inspiring Students to Excel



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If you have news, events, or ideas we might consider for the newsletter, please submit them electronically to jstone@cap.gov.

SPACE NEWS: Mars Rovers, X PRIZE, and X-43A Research Aircraft



Many events are shaping the future of space exploration and commercialization. Among the ones most current are the Mars rovers, the X PRIZE CUP, and the X-43A research aircraft.

Mars rovers, **Opportunity, and its twin Spirit**, successfully completed their primary three-month missions on Mars in April. NASA has extended their missions twice, most recently on Oct. 1, because the rovers have remained in good condition to continue exploring Mars longer than anticipated. Read the entire article at <http://marsrovers.jpl.nasa.gov/newsroom/presreleases/20041111a.html>.



Photo courtesy Jim Campbell/Aero-News Network

On Oct. 4, 2004, SpaceShipOne won the ten million dollar Ansari X Prize by becoming the first private-

ly owned spacecraft to exceed an altitude of 328,000 feet twice within the span of a 14-day period. But this is not the end.....only the beginning. **The X PRIZE CUP & Public Spaceflight Expo** will be held every year for 10 days in Las Cruces, New Mexico. To find out more about this exciting event, go to <http://www.xpcup.com/>.

As of Nov. 16, NASA is preparing to conduct a test flight of the unmanned **X-43A hypersonic research aircraft**. It will zoom



across the Pacific Ocean at 10 times the speed of sound, almost 2 miles per second. This 12-foot long scramjet-powered vehicle will be dropped from the wing of a B-52B at an altitude of 40,000 feet, and then boosted to an altitude of nearly 110,000 feet by a modified Pegasus booster rocket. This flight is a research experiment to provide data on hypersonic air-breathing engine technologies that have large potential pay-offs. To find out more about this technology, go to http://spacelink.nasa.gov/NASA_Projects/Aerospace.Technology/Research.Aircraft/Hyper-X/.

CAP PARTNERS with Aerospace Education Foundation (AEF)

AEF Booth at the 2004 National Conference on Aviation and Space Education



Founded in 1956, by the Air Force Association (AFA), the Aerospace Education Foundation (AEF) is a 501c(3) non-profit educational charity promoting aerospace excellence. The Foundation helps to educate the American public about science, technology and our national defense. Through scholarships, grants, awards and public awareness, AEF provides America with the tools needed to educate the public and our youth on the importance of science and technology to our national defense. Over the past two years, the Foundation has been able to dedicate an average of over a million dollars to aerospace education programs such as the Visions of Exploration program, grants program for teachers, and Civil Air Patrol and Air Force Junior ROTC unit instructors.

The Visions of Exploration program partners with USA TODAY and AFA chapters and reaches over 90,000 4th-8th grade students annually. This program encourages the skills necessary for success in math, science and technology among the nation's elementary

and middle school students. Visions of Exploration provides selected classrooms with a Visions of Exploration Guide containing lesson plans for 18 weeks of the best math, science and technology articles previously published in the USA TODAY newspaper. Each classroom selected will also receive 30 copies of USA TODAY newspapers one day a week for 18 weeks, along with Experience TODAY, a daily lesson plan with cross-curricular activities centered on that day's news. During the 2003-2004 school year, Visions was in 1,298 classrooms nationwide, reaching over 34,000 students.

The Aerospace Education Foundation is an active partner of Civil Air Patrol. Since 1996, AEF has contributed over \$120,000 in grants to support and encourage aerospace education programs in Civil Air Patrol units and educator member classrooms across the country. CAP has also been able to add over 600 new educator members over the last two years through the sponsorship provided by AEF. We have also been a sponsor, exhibitor, and presenter at the National Confer-

ence on Aviation and Space Education (NCASE) for many years. Our partnership has reached thousands of students as a result of AEF's and CAP's continued commitment to educating the youth of America through aerospace education.

The U.S. Space and Missile Command celebrates it's 50th anniversary in 2004. In celebration, the Aerospace Education Foundation would like students to write an essay about the planet they would most like to visit and why. Prizes will be awarded in the following grade categories: 4-6 grade, 7-8 grade and 9-12 grade. For more information on this contest, please visit their web site, www.aef.org.



AEF President, Mary Anne Thompson, gives door prize at NCASE 2004.

Space News:...

(Continued from Page 1)

We are pleased to announce that our AE home page will carry a section called "Periodic Space Updates" to inform our readers of the latest in space news. Go to www.cap.gov/ae and click on the items under number 5. Also, check out the Supplemental Space Module at: <http://www.cap.gov/ssm.html> for the latest on Space - this module includes an introductory lesson on Satellite Tool Kit (STK).

IN THE AEM SPOTLIGHT...MARY ANNE THOMPSON



Mary Anne Thompson

Mary Anne Thompson believes in aerospace education and its value across the curriculum. "Aerospace Education is totally interdisciplinary," she says. "There is no 'aerospace education teacher.' Instead, there are teachers who use aerospace education to excite, motivate, and give lasting learning to students."

This friend to the field of aerospace education is a lifelong learner, educator and manager. She has taken on a variety of professional responsibilities throughout her career and has always accepted the challenges with a "can do" attitude.

Mary Anne was inspired and mentored by the late Jack Sorenson (former Civil Air Patrol director of aerospace education), Dr. Frank Sorenson (educator at the University of Nebraska at Lincoln), and Dr. Merv Strickler ("father of aviation education" and aerospace educator and supporter for many years). Mary Anne has high regard for these aerospace education pioneers and gives them credit for inspiring her to master the field of aviation and space education.

Mary Anne Thompson received her bachelor's degree from Penn

State University; her master's degree in education from the University of Nebraska; and her Education Specialist degree from Troy State University, where she also served as an instructor.

During her career, Mary Anne has managed programs in intelligence, business development and customer relations. She has led national aerospace industry and professional organizations and served as a classroom teacher, school administrator, and museum educator. She has worked in school systems in Nebraska and Alabama, an Air Force base school in Spain, and the Air and Space Museum in Washington, D.C., where she was the director of curriculum in the Educational Division.

Mrs. Thompson has also offered her expertise and management skills to TRW Inc. (Northrop Grumman Mission Systems), retiring after 20 years of service. She now runs her own consulting firm. In 1993, she received the TRW Woman of Achievement Award.

She currently serves as president of the Aerospace Education

Foundation (AEF), an affiliate of the Air Force Association, and is responsible for the oversight and management of all Foundation programs and coordination of the Board of Trustees.

Mary Anne has been involved with Civil Air Patrol for many years as the Nebraska Wing Aerospace Education Officer and Administrative Officer. She played a key role in the development of the Falcon Force program and has written four activity books for CAP. Her special "claim to fame," however, is her leadership in assisting in the planning and executing of CAP's National Conference on Aviation and Space Education. CAP honored Mary Anne in 1997 with the coveted Crown Circle Award for Aerospace Education.

Mary Ann Thompson is one professional who practices what she preaches. She continues to promote and support aerospace education as a valuable tool for teachers at all grade levels and across all curricular lines. As Mary Anne says, "Be an advocate for aerospace education!"



Mary Anne Thompson (second from right) Emcees Silver Eagles Panel at NCASE 2004

IN THE AEO SPOTLIGHT... CAPT. FRANK KALUPA



The Virginia Wing's newly selected aerospace education officer of the year is a newcomer to the Civil Air Patrol - but not to sharing his enthusiasm for the wonders of aerospace.

Dr. Frank Kalupa was recruited into the CAP just a couple of years ago thanks to his son, a longtime CAP member in Alabama and Georgia. "Mark was certainly right when he recognized this as an ideal opportunity for an educator like me to help with one of CAP's core missions," says Capt. Kalupa.

Capt. Kalupa's interest in aerospace began as a science news writer in Southern California when

covering the early years of America's space program and especially the first manned missions and the moon landings. "What an exciting time that was," he recalls. During 12 years in journalism and corporate public affairs, he was a reporter and an editor with newspapers in California and Wisconsin and Director of Communication for an aerospace research and development center in California.

Today he is Deputy Commander of the Winchester Composite Squadron and also serves Virginia Wing's Group Three in aerospace education, professional development, and drug demand reduction. He is also a mission observer and scanner.

A major emphasis since joining CAP in 2002 has been assisting senior members in aerospace education and what he sees as the closely related professional development programs required for progression in rank and leadership responsibilities. He has developed and conducted training classes for the Yeager Award and senior officer course as well as made numerous presentations for SLS and CLC pro-

grams in Virginia and the Great Lakes Region Staff College at Grissom ARB in Indiana.

He has earned the Yeager and Crossfield aerospace education awards, and a Commander's Commendation as well as the 2004 AEO award, which Wing Commander Col. Richard L. Mosley presented in November.

He received a Ph.D. in communication and a master's degree in journalism from the University of Southern California and a bachelor's degree in philosophy from the University of Wisconsin, Madison. He was a professor at the University of Texas at Austin for 15 years before relocating to Virginia in 2002 to concentrate on consulting. He served on faculties in California, Iowa, Ohio, and Georgia. He has lectured in Nova Scotia, Chile, Mexico, Spain, and Morocco.

He is privileged to have a son, Mark, who serves in the U.S. Army Special Forces; a married daughter, Marni, who served with distinction domestically and abroad; a son-in-law, Jimmy, an aerospace engineer; and two grandsons, Mason and Palmer.

AEO KIT INFORMATION

From time-to-time we get calls from newly-appointed Aerospace Education Officers (AEOs) at the squadron level asking us for guidance on how to do their job. They usually do not know that there are aerospace education regulations, pamphlets, newsletters, and websites designed to help them make aerospace real for their students. Therefore, we, at National Headquarters, have introduced to all officially-appointed AEOs at the

'none' and 'Technician' specialty track skill-level a free kit of materials. Once we are officially notified that a member has been appointed via the CAPF 2a, the annotated Senior Training Report, or Attachment 1 to CAP Pamphlet 215, we will send out a packet that includes CAP Regulation 280-2, Civil Air Patrol Aerospace Education Mission; CAP Pamphlet 215, Civil Air Patrol Senior Member Training Program Specialty Track Study Guide-Aerospace Education Officer (AEO); CAP Pamphlet 15, Aerospace Education Officers'

Handbook; a copy of the latest Aerospace Education News; as well as a copy of the Civil Air Patrol Model Rocketry book. Since we have started this program, over 100 new AEOs have been sent the AEO kit! In addition, we encourage them to visit our website at: <http://www.cap.gov/ae>, where they can find numerous helpful aids in conducting their aerospace program such as conferences, contacts, programs and products, grants and awards, resources, on-line testing, and much more.

AEO/AEM NEWS AND VIEWS

Aerospace Education Officers' School

We would like to announce that the 4th annual AEO School is scheduled for July 21-23, 2005 at Pensacola NAS, Florida. DAEs and AEOs will gather to discuss the latest developments and projects in aerospace education, as well as, cover all of the important topics related to the DAEs and AEOs responsibilities as aerospace officers. Historically, heavy emphasis has been placed on reports, plans of action, compliance inspections, and awards. The outreach program, AEMs and hands-on activities will also be discussed in detail. Feedback from attendees of this school has been very positive. If you want to learn more about your job, interact with peers, and find solutions to problems, this is where you ought to be. Information concerning registration is coming soon to our website at www.cap.gov/ae.

Educators Soar in Fly-A-Teacher Program



Educator Experiences Fly-A-Teacher Program

The Civil Air Patrol is offering the CAP Fly-A-Teacher Program. This program, using orientation flights and National Standards-

based materials to teach aviation basics in a fun and exciting way, has been created just for educators.

The Fly-A-Teacher Program provides the opportunity for teacher orientation flights in CAP general aviation aircraft. Orientation flights are arranged and coordinated with local CAP squadrons and pilots. Flights are usually conducted at local area airports.

The Fly-A-Teacher Program is also be a program of instruction using hands-on discovery. CAP provides the tools and materials for conducting your own one-day aviation education workshop. The workshop is designed to enable teachers to increase student interest in aviation and aerospace by using practical applications in the content areas of math, science and technology. Participants learn ways to excite students about the multitude of aerospace career options.

If you would like to arrange CAP teacher orientation flights for yourself and teachers at your school and/or host a CAP Fly-A-Teacher workshop, please contact: Claudine Sayegh, CAP NHQ Aerospace Education Program Manager; 240-857-0166; Email: claudine.sayegh@andrews.af.mil.

For CAP Aerospace Education Officers (AEOs): If you'd like to follow up on this NHQ announcement of opportunity for AEMs and arrange orientation flights, a listing of all AEMs in your state with their contact information can be obtained from AEM Program Manager, Kathy Baucum. Please contact Kathy at kbaucum@cap.gov, or at 334-953-4213. She will send you a list electronically or in hard copy. Any educator nationwide can become a CAP AEM and be eligible to participate in this program. We encourage you to recruit educators!



Aerospace Education Foundation (AEF) Grants

At the time of this writing, grant applications were still being received for the CAP unit winter cycle. The results will be posted in the next newsletter issue. It is not too soon for AEMs to get their applications in for the spring cycle. The deadline is March 31, 2005.

As a reminder, AEF is a wonderful and generous partner to CAP. They continue to provide outstanding support to our aerospace education mission. AEF has provided over \$ 115,000 in grants to help promote aerospace in the classrooms and to our CAP members.

These grants are used for aerospace-related activities and cannot be used for flying instruction, honor guard, color guard or buying uniforms. A grant request cannot exceed \$250. Applications can be found on our website at http://level2.cap.gov/documents/u_061604142106.doc. Download the form, complete it and send it to us.

Finally, if you have received a grant recently and haven't completed the feedback form, please do so. It is the least we can do to show our appreciation for AEF's support.



What was the name of the spacecraft that recently won the \$10 million X PRIZE?

- a. Astroliner
- b. SpaceShipOne
- c. Solaris X
- d. WildFire

(Answer on page 7)



REGION TO REGION

NORTHEAST REGION

March 14-16

The 40th annual meeting of the Northeastern Section of the Geological Society of America will be hosted by the Geology Departments of Union College, Schenectady, New York, and Skidmore College, Saratoga Springs, New York. The meeting will be at the Prime Hotel and Conference Center, located in Saratoga, NY. For more details, go to <http://www.geosociety.org/sect-div/northe/05nemtg.htm>.

MIDDLE EAST REGION

March 9

The Physical Science Solutions Teacher Workshop at the Science Museum of Virginia will be held from 9:00 am - 3:30 pm. The six-hour hands-on program enhances Force, Motion and Energy & Matter strands of the Virginia SOLs. Log on to <http://www.smv.org/prog/Just%20for%20Teachers%202004-05%20flyer.pdf> for more information.

GREAT LAKES REGION

Feb. 10-12

Science Education Council of Ohio's annual conference will be held in Columbus, OH. To find out more, go to <http://www.secoon-line.org/asp/default.asp>.

SOUTHEAST REGION

Mar. 19-20

The Florida International Air Show's 25th Anniversary event will be held at the Charlotte County Airport in Punta Gorda, FL. For more details, go to <http://www.heraldtribune.com/apps/pbcs.dll/section?CATEGORY=AIRSHOW>.

NORTH CENTRAL REGION

April 3-5

The 67th Annual International Technology Education Association's Conference will take place in Kansas City, MO. Find out more at <http://www.iteawww.org/D.html>.

SOUTHWEST REGION

Feb. 3-5

The 11th Annual Space Exploration Educators Conference will be held at Space Center Houston in Houston, TX. For more information, go to <http://www.space-center.org/seec.html>.

March 2

The Embry-Riddle Industry/Career Expo will be held in the Activity Center at the Prescott, AZ campus. The Expo is free and open to the public. For more information, contact Mary Van Buren at 386-226-6525.

March 11 (Application deadline)

Middle School Aerospace Scholars (MAS) is a unique program for teams of Texas middle school teachers. The program is funded by the State of Texas and administered by NASA Johnson Space Center. Professional development at Johnson Space Center in Houston, TX is included. For information on this program, go to <http://aeroscholars.tamu.edu/>.

March 10-12

The 16th Annual International Women in Aviation Conference will be held in Dallas, TX. For registration and other information, go to <http://www.wai.org/events> or call 386-226-7996.

March 31-April 3

National Science Teachers Association (NSTA) will hold its 53rd National Convention in Dallas, TX. For information and registration, go to http://www.nsta.org/convention/detail&Meeting_Code=2005DAL.

ROCKY MOUNTAIN REGION

April 4-7

The National Space Symposium will be held at The Broadmoor in Colorado Springs, CO. For more information go to <http://www.space-symposium.org/national05/information/index.cfm>.

PACIFIC REGION

Feb. 9-12

The Soaring Society of America's Convention and Air Sports Expo will be held in Ontario, CA. For more information, go to <http://www.ssa.org/online/home.htm>.

April 6-9

The National Council of Teachers of Mathematics (NCTM) will hold its Annual Meeting and Exposition in Anaheim, CA. For more details go to <http://www.nctm.org/meetings/anaheim/>.

EVENTS OF INTEREST

Feb. 2

ISS EarthKAM Program for Middle School Students. See missions scheduled and learn more about the program at <http://www.earthkam.ucsd.edu/>

Feb. 20-26

Engineers Week. For more information, go to <http://www.eweek.org/>
Jan 1 - April 30

Astro-E2 Competition for High School Students. Observe the Universe with the latest NASA X-ray observatory! The Astro-E2 E/PO program is offering a new and innovative program that will open doors of research to a team of highly motivated, independent high school students. For more information, email: competition-astroe2@athena.gsfc.nasa.gov.

Objective:

Students will test the strength of columns in relation to their shapes.

National Science Standards:

Content Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Content Standard B: Physical Science

- Properties and changes of properties in matter

Content Standard E: Science and Technology

- Abilities of technological design

Unifying Concepts and Processes

- Evidence, models, and explanation

Grade Level(s):

5-8

Time Period:

30-45 minutes

Background Information:

Computers can predict how certain systems should behave, but you never know for sure until you do a real test. Testing a system can validate the prediction, or it can also point out where the prediction was wrong.

We learn a great deal when something unusual happens in a test. In fact, we can learn more from our failures than from our successes. Fixing what went wrong helps us prevent more mistakes later.

In this activity you will test the strength of different shaped columns. Can you apply your testing to the real world?

Materials:

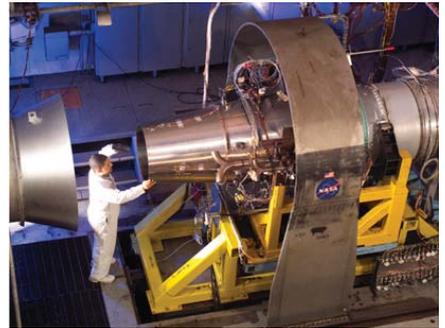
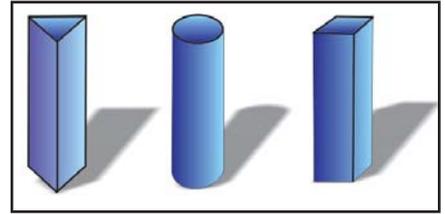
- 3" x 5" index cards
- ruler
- masking tape
- empty coffee can
- sand
- scale

Procedure:

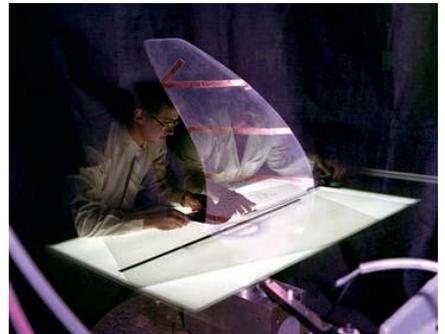
1. As a team, brainstorm how to make 5-inch tall columns from a single index card, which when viewed from one end looks like geometric shapes -- square, triangle, circle, etc.
2. Assemble several different columns of each shape using no more than 5 inches of tape.
3. Test each column by placing the empty coffee can on top and gradually filling it with sand until the column fails. Make sure to keep the sand from spilling out as the can falls. Weigh the can of sand and record results.

Evaluation:

1. Which column was the strongest? Why?
2. Compare your results to the data gathered by other teams.



Testing Jet Engines



Testing Airfoils

Shape Testing Team Names:

Shape	Weight Held	Ranking

Answer to Cappy's Quiz

b. SpaceShipOne

CURRICULUM CORNER - BRING IN THE CLOUDS

Objective:

Students will investigate the conditions that must be present for clouds to form.

National Science Standards:

Content Standard D: Earth and Space Science

- Structure of the earth system

Grade Level(s):

5-8

Time Period:

50 minutes

Background Information:

Clouds may be classified by shape, content, or cloud height. The two basic shapes under which clouds may be classified are: stratus—layered and sheet-like—and cumulus—puffy and heap-like. Many clouds exhibit combinations of both traits. There are three main types of clouds: cirrus clouds, cumulus clouds, and stratus clouds. Cloud content may include water droplets only, a mixture of water and ice, or just ice. Cloud heights are generally described as low (under 2 kilometers [km]), medium (2-6 km), or high (6-12 km); these are average cloud heights for the mid-latitudes.

Three things are necessary for cloud formation: cooling of air, water vapor, and condensation nuclei. Water vapor must have something to condense on in order to form the droplets that compose clouds. Many things can serve as condensation nuclei. Some of the most common include dust, pollen, salt from ocean spray, and smoke.

Materials:

- 1-liter (or larger) clear glass jar with lid (large mouth jars work best)
- Ice cubes or crushed ice
- Hot water (Caution: Even very warm water will do. Do

not use water that is hot enough to burn your skin.)

- Matches
- Can of aerosol spray (air freshener is suggested)
- Black construction paper
- Safety goggles
- Flashlight (optional)

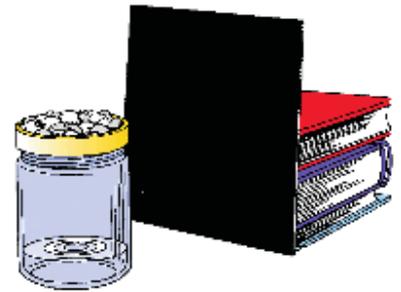
Procedure:

Safety First! -

- **Be sure that all materials are either centrally located or already distributed to the groups of students.**
- **Note that, depending on the students, the teacher may choose to light all matches for them to reduce the risk of accidents or horseplay.**
- **Be careful: Flames and aerosol cans are an explosive combination. (Holding a lit match in front of an aerosol can makes a flamethrower.)**
- **Ensure that students never have access to both the matches and the aerosol at the same time.**
- **Note: If the teacher feels the aerosol represents too great a risk for his/her students, we strongly recommend that the aerosol not be used at all. The important points of the activity can be demonstrated using only smoke.**

Student Directions:

1. Fill the jar with hot water. Do not use water that is hot enough to burn your skin.
2. Pour out most of the hot water, leaving about 2 centimeters (cm) of water in the bottom of the jar. Hold the black paper upright, or prop it up against some books behind the jar.
3. Turn the lid of the jar upside down, and fill it with ice. Now, place the lid on the jar as shown in the figure. Observe the jar for 3 minutes. If you have a flash



light, darken the room, and shine the flashlight on the jar while you observe it. Record your observations in the Data Table, next to the box marked "Control."

4. Pour the water out of the jar, and repeat steps 1 and 2.
5. Prepare the lid so that you can immediately cover the mouth of the jar during the next step.
6. Move all loose papers away from the jar, put on your safety goggles, strike a match, and drop the burning match into the jar. Cover the mouth of the jar immediately (with the ice-filled lid). Record your observations in the Data Table next to the box marked "Match." Be extremely careful with the matches.
7. Pour out the water in the jar, and repeat steps 1 and 2.
8. Spray a very small amount of the aerosol in the jar, and immediately cover the mouth of the jar with the ice-filled lid.
9. Observe what happens in the jar for 3 minutes, and record your observations in the Data Table next to the box marked "Aerosol."

Bring in the Clouds Observation Sheet

Trial	Observations
Control	
Match	
Aerosol	